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3 August 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SECRETED PROTEIN FACTOR AND CELL MEMBRANE-BOUND SPLICE VARIANT

(57) Abstract: A novel mammalian protein system is disclosed. This system comprises a secreted protein factor and its related membrane-bound splice variant. These novel proteins have no homology to any known protein or class or protein, yet are ubiquitously expressed in nearly all tissue types. Also disclosed are novel nucleic acids that encode the novel polypeptides of the invention. The protein system was discovered in purified populations of murine hematopoieitc stem cells. The cDNAs of the invention were cloned from a murine hematopoietic lineage negative (Lin) library.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/41742

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61K 38/00(2006.01),38/17(2006.01);C07K 14/00(2006.01);C12N 1/21(2006.01),1/15(2006.01),5/10(2006.01),15/12(2006.01),15/63(2006.01)

USPC: 530/399;514/12;530/350,387.3;435/325,69.1,358,252.3,252.33,254.11,254.2,320.1;536/23.1,23.5

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 530/399; 514/12; 530/350, 387.3; 435/325, 69.1, 358, 252.3, 252.33, 254.11, 254.2, 320.1; 536/23.1, 23.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	WO 00/12708 A2 (GENENTECH, INC.) 09 March 2000 (09.03.2000), See Figure 215 (SEQ ID NO:371), Figure 216 (SEQ ID NO:372); pp 259-261 (only relevant pages enclosed). SEQ ID NO:372 shares 90% sequence identity to SEQ ID NO:1.	1, 3, 5, 7. --------- 9
X --- Y	WO 00/52151 A2 (INCYTE PHARMACEUTICALS, INC.) 08 September 2000 (08.09.2000), entire document, especially pp 5-8, 34, and 39. SEQ ID NO:8 shares 90% sequence identity to SEQ ID NO:1.	1, 3, 5, 7 --------- 9
X,P --- Y,P	US 2003/0073129 A1 (BAKER et al) 17 April 2003 (17.04.2003), See Figure 215 (SEQ ID NO:371) and Figure 216 (SEQ ID NO:372), pg 141[2326] - pg 142[2345] (only relevant pages enclosed). SEQ ID NO:373 shares 90% sequence identity to SEQ ID NO:1.	1, 3, 5, 7 --------- 9

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 April 2006 (25.04.2006)	07 JUN 2006
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner of Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Jon M. Lockard Telephone No. (571) 272-1600

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-5, 7, and 9 (drawn to SEQ ID NO:1, 5, and 21)

Remark on Protest
☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-5, 7, and 9, drawn to polypeptides of SEQ ID NO: 1 and 21, and kits comprising the same.

Groups II-X, claim(s) 1-5, 7, and 9, drawn to polypeptides of SEQ ID NO: (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively, and kits comprising the same.

Group XI-XX, claim(s) 6, 10, and 21, drawn to polynucleotides of SEQ ID NO:5, 7, 11, 15, 19, 6, 8, 12, 16, and 20, respectively, , vectors and host cells, and a method for recombinantly producing the polypeptide encoded thereby.

Group XXI-XXX, claim(s) 8, drawn to antibodies that bind the polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively.

Group XXXI-XL, claim(s) 11, drawn to a method for screening compounds that bind a polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively.

Group XLI-L, claim(s) 12-20, drawn to a method for screening a polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively, that binds to a cell.

Group LI-LX, claim(s) 22, drawn to molecules of undisclosed constitution that bind a polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively.

Group LXI-LXX, claim(s) 23, drawn to RNAi molecules that interfere with the expression of a polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively.

Group LXXI-LXXX, claim(s) 24, drawn to aptimers that bind to a specific portion of a polypeptide of SEQ ID NO: (1 and 21), (3 and 23), (9 and 25), (13 and 27), (17 and 29), (2 and 22), (4 and 24), (10 and 26), (14 and 28), and (18 and 30), respectively.

The inventions listed as Groups I-LXXX do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I is directed to a polypeptide comprising the sequence of SEQ ID NO:1 or a variant polypeptide corresponding to SEQ ID NO:1 in which one or more amino acids are replaced, deleted, inserted, and/or added. However, since Baker et al. (US 2003/0073129 A1, filed 04 September 2001) teaches a polypeptide set forth as SEQ ID NO:372 that shares 90% sequence identity to SEQ ID NO:1 of the Instant Application (See attached sequence alignment), no special technical feature exists for Group I as defined by PCT Rule 13.2, because it does not define a contribution over the prior art. Because the technical feature of Group I is not a special technical feature, and because the technical features of the Groups II-LXXX inventions is not present in the Group I claims, unity of invention is lacking. Furthermore, the polypeptides of Groups I-X, the polynucleotides, vectors, and host cells of Groups XI-XX, the antibodies of Groups XXI-XXX, the molecules of unspecified constitution of Groups LI-LX, the RNAi molecules of Groups LXI-LXX, and the aptamers of Groups LXXI-LXXX, are structurally and functionally different chemical compounds, each of which can be made and used without the other compound. The methods of Groups XXXI-XL and XLI-L require compounds which are functionally different from each other and each can be made and used without the other. Lack of unity is shown because these compounds lack a common utility which is based upon a common structural feature which has been identified as the basis for that common utility.

INTERNATIONAL SEARCH REPORT

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Continuation of B. FIELDS SEARCHED Item 3:
Patent and Commerical Sequence Databases, EAST, STN/CAS
SEQ ID NOs: 1, 5, and 21, Inventor Name